

WHAT IS CLAIMED IS:

1. A laser apparatus for emitting a beam of coherent light directed along an optical axis, comprising:
 - a first and second optical element;
 - at least one light-emitting diode producing a beam of light directed along an optical excitation path transverse to the optical axis of the laser apparatus;
 - a gain medium disposed in the optical axis and the optical excitation path, intermediate the first and second optical elements, for producing the beam of coherent light along the optical axis; and
 - a guiding member for directing the beam of light produced by the at least one light-emitting diode toward the gain medium.
2. The laser apparatus according to Claim 1, wherein the guiding member is disposed between the at least one light-emitting diode and the gain medium.
3. The laser apparatus according to Claim 1, wherein the guiding member is comprised of a reflective material.
4. The laser apparatus according to Claim 1, wherein the gain medium comprises a liquid.
5. The laser apparatus according to Claim 1, wherein the gain medium comprises a solid material.
6. The laser apparatus according to Claim 5, wherein the gain medium comprises a dye-doped polymer or a dye-doped Silica-polymer.
7. The laser apparatus according to Claim 1, wherein the gain medium has at least one substantially planar side, and the at least one planar side is disposed toward the light-emitting diode.

8. The laser apparatus according to Claim 1, wherein the gain medium has a high angle of incidence.

9. The laser apparatus according to Claim 1, wherein the first or second optical element is a multiple-prism beam expander.

10. The laser apparatus according to Claim 1, wherein the first or second optical element is an output-coupler polarizer.

11. The laser apparatus according to Claim 1, wherein the guiding member comprises two opposing sides angled at an angle σ to form an opening disposed in the optical excitation path opposite the light-emitting diode.

12. The laser apparatus according to Claim 11, wherein the opening is disposed proximate the gain medium.

13. A method for emitting a beam of coherent light directed along an optical axis, comprising the steps of:

directing a beam of light produced by at least one light-emitting diode along an optical excitation path transverse to the optical axis;

geometrically confining the beam of light produced by the at least one light-emitting diode;

directing the geometrically confined beam of light through an opening onto a gain medium disposed in the optical axis and the optical excitation path; and

reflecting the beam of light relative to the gain medium to direct the reflected beam to produce the beam of coherent light directed along the optical axis.

14. The method according to Claim 13, further comprising the step of repeating the reflecting step to produce the beam of coherent light directed along the optical axis.

14. The method according to Claim 13, wherein the step of reflecting is accomplished using the principle of grazing-incidence.

16. A laser apparatus for emitting a beam of coherent light comprising a light-emitting diode optically exciting a dye-doped laser gain medium.

17. The laser apparatus according to Claim 16, wherein the dye-doped laser gain medium is a dye-doped polymer gain media or a dye-doped Silica-polymer gain media.